

Remarks:

Claim 41-49, 51-64, 66-82, and 84-95 remain for consideration in this application. Of these claims, claims 41, 53, 71, 89-95 are in independent format.

Turning now to the office action, it is noted with appreciation that the Examiner has found all rejections from the last office action to be overcome. The Examiner did, however, locate a further reference and has raised rejections based upon that reference. Specifically, the Examiner has rejected claims 41-43, 48-49, 51-53, 55, 57-59, 63-71, 73, 75-77, 81-82, 84-92, and 94-95 under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent Publication No. 2005/0031964 to Babich et al. The Examiner also rejected claims 54, 56, 72, 74, and 93 under 35 U.S.C. 103(a) as being unpatentable over the Babich et al. reference.

The Babich et al. reference has a filing date of August 5, 2003. Applicants have attached to this Amendment a Declaration under 37 C.F.R. §1.131 showing that the Applicants reduced the claimed invention to practice in the United States prior to August 5, 2003. The Declaration is signed by Dr. Jim D. Meador, one of the inventors named on the above-referenced patent application. Exhibits A and B show: the preparation of a composition within the scope of composition claims 41-49, 51-52, 89, and 95; a structure within the scope of claims 53-64, 66-70, and 90-91; and a method within the scope of claims 71-82, 84-88, and 92-94. The dates on these Exhibits have been blocked out, but Dr. Meador declares that those dates are earlier than August 5, 2003.

The Declaration provides a detailed explanation of where each limitation of each independent claim can be found in the accompanying Exhibits. To summarize, Exhibit A describes the preparation of a polyhedral oligomeric silsesquioxane ("POSS") with an alcohol functionality. The


POSS was used to prepare a composition by dissolving or dispersing the POSS in a solvent system. The composition also included an aminoplast cross-linking agent, catalyst (which is also a strong acid), and a weak acid.

Exhibits A and B also show how the composition was spin-coated onto a substrate to form a layer. Exhibit B shows the processing conditions (spin speeds, curing conditions, film thicknesses, and exposure and developments steps) used to form a layer of the composition on a substrate, to apply a photoresist to that composition layer, and to pattern the photoresist.

It is respectfully submitted that the above argument, along with the detailed explanation provided in the attached Declaration by Dr. Meador (and accompanying exhibits), shows possession of the claimed invention prior to the filing date of the Babich et al. reference. Thus, the Babich et al. reference is not available as prior art against the presently pending claims because the Babich et al. application was not filed prior to the invention of the claimed invention by the Applicants.

The Examiner raised no further rejections and cited no further references in this office action. Therefore, a Notice of Allowance appears to be in order. Any additional fee due in conjunction with this amendment should be applied against our Deposit Account No. 19-0522.

Respectfully submitted,

By 
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ATTORNEYS FOR APPLICANT(S)

PROJECT

Copolymerization of Methacrylates
- POSS and Hydroxypropyl Methacrylate

Continued From Page

MAO717, Methacrylates, POSS in solution in PGMEA at ambient conditions

A 100 ml three-necked flask equipped with magnetic stirring bar, thermometer, nitrogen inlet, and connected with nitrogen outlet was charged with 4.00g (0.035 mmol) of MAO717, 2.67g (0.035 mmol) of hydroxypropyl methacrylate (265542-1L) (2.67g (0.035 mmol) of AIBN (44, 109-0). 60.7g (0.666) of PGMEA

The mixture was flushed with nitrogen at ambient conditions from 11:13 AM Wed. to 11:38 AM Wed. and the flask then immersed in a oil bath at 65°C. The mixture was stirred under nitrogen. Sol. temp 60°C at 11:45 AM Wednesday. Sol. temp 62°C at 11:57 AM Wed. Sol. temp 62°C at 12:10 PM Wednesday. Sol. temp 61°C at 1:00 PM Wed. Sol. temp 61.5°C at 1:24 PM Wed. Sol. temp 63°C at 3:32 PM Wed. Sol. temp 61.5°C at 4:55 PM Wed. Sol. temp 61°C at 8:07 AM Thursday. Sol. temp 62°C at 11:04 AM Thursday. Sol. temp 60.5°C at 11:55 AM

then and with the nitrogen still flowing the flask was removed from the oil bath. With the solution temperature at 26.5°C, 17.1 mg of 4-methoxyphenol (M1, 863-5) was added. The mixture was stirred from 12:38 PM to 1:00 PM 30 min. On adding a drop of the solution of 4-methyl phenol (M1232), a precipitate was observed which was removed. One titration yield of product = 66.53g. This was a very small amount of insoluble in the solution. (M1232) a precipitate was observed which was removed. One titration yield of product = 66.53g. This was a very small amount of insoluble in the solution.

End of Charge

- | | MAO717 | 4.00g | 1.20g (dithion) |
|---|----------------------------|-------|--------------------|
| 3 | MAO717 | 4.00g | 1.20g (dithion) |
| 1 | hydroxypropyl methacrylate | 2.67g | |
| 2 | PGMEA | 60.7g | |
| 4 | AIBN | 66.6g | 55.2mg (insoluble) |

Percent nitrogen in the polymer = $0.20/0.72 \times 100 = 17.94$

After adding the 4-methoxyphenol theoretical yield is

9.97g (polymer solid)

67.45g

0.2746 mmol hydroxyl group

24 hr at 60.5-63°C

Read and Understood By

Continued on Page
Mw was 55,700
Mn was 20,200
D was 276

J. D. Meador

Signed

Date

Signed

Date

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PROJECT Preparation of EML from
JM2404-43

Notebook No. 2404

Continued From Page

2 250 ml Halogen bottles were charged with the following ingredients in the stated order and the mixtures stirred to homogeneity at ambient conditions.

(M-L) JM2404-43	30.0 g	2.99 g polymer, 8.238 g hydrolyz.	27.7 PGMEA	
PGMEA	89.8 g			
PWL (LI 3/10/02)	0.886 g (3.5%)	0.24 mag	21.2% PWL	0.886 g
4-75% H ₂ O (40, 288-5)	36.3 g			0.886 g + 2.86 g
Original S/10, 303-2	110.8 g			
	120.83 g	3.33%		

The homogeneous solution was taken off the magnetic stirring plate on Friday afternoon. Rather than decanting the solution was taken directly to the clean room. It was at 1500 rpm for 60 sec. followed by a run at 20.5°C / 60 sec. - then gave 66.7%. A small amount of smoke was given off during the bake. Ethyl acetate strip was +0.59%. Polymerization did occur!

About 11:15, the EML was decanted by Tim using a 5.8 g of PGME - washed 650°C beads from 11:31 AM Monday at 3:27 PM Monday (4 hr). The beads were removed by straining thru 2 layers of plastic cloth. The EML was then twice filtered thru a 0.1 µm org. part into 125 ml Halogen bottles.

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Read and Understood By

Jim D. Macdon

Signed

Date

Signed

Date

Processing Conditions

ARC29A-8

Bake: 205 °C/60 sec.
Thickness: 77 nm

EML JM2404-44

Coating: 1250 rpm/60 sec.
Bake: 205 °C/60 sec.
Thickness: 73.6 nm *

* BSI data

Resist: GARS8107A10

Modified acrylate, dense lines
Dispense: Manual
SB: 115°C/90 sec.
Thickness 200 nm
Exposure Tool:
ASML 5500/1100,
NA 0.75, λ 0.89/0.55
Dipole illumination
Mask: TM99LF 9%attPSM
E 16.0 \pm 0.5 mJ/cm²
F 0.0 \pm 0.1
FEM E15xF15
PEB: 110°C/90 sec.
Develop.: OPD262-LD60 sec.



Mariya Nagatkina

Reference to IMEC is obligatory for representations



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